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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:

Confirmation No.: 2876

CHRISTIANSEN ET AL.

Application No.: 09/097,383

Group Art Unit: 3769

Filed: June 16, 1998

Examiner: SHAY, DAVID M.

Title: LIGHT PULSE GENERATING APPARATUS AND COSMETIC AND THERAPEUTIC  
PHOTOTREATMENT

**- REPLY BRIEF UNDER 37 C.F.R. §41.41 -**

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Sir:

The Appellants hereby submit this Reply Brief in response to the Examiner's Answer  
of September 30, 2009.

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Date: November 30, 2009

**I. Introduction**

Pursuant to 37 C.F.R. § 41.41, this Reply Brief is being filed within two months of the Examiner's Answer mailed September 30, 2009 (hereinafter "Answer"). This Reply Brief responds to the new points that the Examiner has raised in the Answer.

**II. Status of Claims**

Claims 1-3, 8, 10-15, 18 and 23-25 are pending in the application. Claims 4-7, 9, 16-17, 19-22 and 26-28 are cancelled. Claims 1-3, 8, 10-15, 18 and 23-25 are rejected. The rejections of claims 1-3, 8, 10-15, 18 and 23-25 are appealed herein. Claim 1 is independent. Claims 2, 10, 12, 13, 18 and 23 depend from claim 1. Claims 3 and 8 depend from claim 2. Claim 11 depends from claim 10. Claim 14, 15 and 24 depend from claim 13. Claim 25 depends from claim 24.

**III. Grounds of Rejection to be Reviewed on Appeal**

Claims 1 and 23, which are presently on appeal, stand rejected under 35 U.S.C. §103(a) based on Eckhouse (U.S. Pat. No. 5,620,478) in view of Berry *et al.* (U.S. Pat. No. 1,677,016) (hereinafter "Berry"). Claims 1-3 and 8 stand rejected under 35 U.S.C. §103(a) based on Eckhouse in combination with Berry as applied to claims 1 and 23 above, and further in view of Gustafsson (U.S. Pat. No. 5,320,618). Claims 10-15, 24 and 25 were rejected under 35 U.S.C. §103(a) based on Eckhouse in combination with Berry and Gustafsson as applied to claims 1-3 and 8 above, and further in view of Anderson *et al.* (U.S. Pat. No. 5,785,844) (hereinafter "Anderson") and Optoelectronics. Claim 18 was rejected under 35 U.S.C. §103(a) based on Eckhouse in combination with Berry and Gustafsson as applied to claims 1-3 and 8 as above, and further in view of Vassiliadis *et al.* (U.S. Pat. No. 3,703,176) (hereinafter "Vassiliadis").

**IV. Response to Examiner's Arguments**

It was a feature of the examination of this application leading up to the first appeal that the Examiner repeatedly conflated features disclosed in Eckhouse relating to one embodiment (Figure 1) with features disclosed in Eckhouse in relation to a different

embodiment (Figure 4) so as to construct from the combination an alleged disclosure of something which in reality Eckhouse did not disclose.

This is reflected in the 'Findings of Fact' in the decision on the first appeal at page 4, starting at line 18. As set out there, Eckhouse discloses in Figure 1 an embodiment for use in external treatment of the skin that does not use water for cooling or any other purpose. In Figure 4, Eckhouse discloses a second embodiment which comprises a light source coupled to an optical fiber in which water is used to surround and cool the light source within a reflector. This is a form of apparatus suitable for use in treating internal body structures.

Appellants respectfully submit that the same pattern of conflation of the two distinct embodiments of Eckhouse runs through the Examiner's answer, as remarked on in more detail below.

**a) Rejection of claims 1 and 23 under 35 U.S.C. §103(a) over Eckhouse (U.S. Patent 5,620,478) in combination with Berry (U.S. Patent 1,677,016).**

In the Answer, the Examiner identifies two allegedly obvious combinations based on Eckhouse and Berry to reject claim 1.

The first rationale for combining Eckhouse and Berry is that it would have been obvious "to employ the cooling system of Berry in the device of Eckhouse, since Eckhouse teaches that it is important to keep the tissue surface cool." *See* Answer at page 4. This first combination accurately reflects the objection stated in the final Office Action dated 11<sup>th</sup> June 2008, at page 5, last paragraph.

The second rationale for combining Eckhouse and Berry is that it would have been obvious "to employ the lamp of Eckhouse in the treatment system of Berry, since Eckhouse teaches the performing (sic) invasive procedures (see column 10, lines 26-27)..." *See* Answer at pages 4 and 5. Appellants note that this second rationale for the objection was not stated in the final Office Action.

Regarding the first rationale for objection, the Examiner takes issue with Appellants' argument that the purpose of Eckhouse is to cause heating, so that it would not be logical to try to take out heating radiation on the basis of reading Berry. *See* Answer at page 6. The Examiner points to the various passages of Eckhouse for uses that supposedly do not require heating.

Appellants submit that the only combination that is possible from Eckhouse and Berry that can be relevant here is the introduction from Berry into Eckhouse Figure 1 embodiment of “water...to absorb heat radiations or to keep the apparatus cool or both” (*see* Berry at col. 1, last paragraph) because water is already present in Eckhouse Figure 4. Therefore, discussion of reasons for making this combination should be confined to those that apply meaningfully to Eckhouse Figure 1 embodiment.

In the Answer, the Examiner refers to col. 9, lines 9-10 of Eckhouse where Eckhouse describes the use of an optical coupler for “photography... to provide a flash for picture taking.” *See* Answer at page 6. This passage is concerned clearly with the Figure 4 embodiment that already has water. Appellants’ argument that Eckhouse relied purely on heating was concerned with Eckhouse’ Figure 1 embodiment, which is the only one of relevance for the proposed combination. The Examiner’s point is therefore a false one conflating again two different embodiments. However, Appellants’ argument would apply more generally also to all of Eckhouse’ description of apparatus for therapeutic application of light to the body, even where the Figure 4 embodiment is in question. For all such purposes, Eckhouse uses heating. The passage in Eckhouse regarding photography concerns the design of a coupler for coupling light from a light source to an optical fiber efficiently. Thus, Eckhouse here describes a camera having an internal flash bulb communicating light to outside the camera via an optical fiber. While that purpose would not depend on heating, it is remote from the field of the discussion and seems to be nothing more than a debating point.

However, even in relation to a photographic use of the design of Eckhouse for optical coupling, there would seem to be no logic in the proposition that it would have been obvious to combine the water filter of Berry with the optical coupling for photography of Eckhouse (even leaving aside the fact that the relevant embodiment of Eckhouse already has the water for cooling the light source). For photography, there would seem to be no gain in filtering out heating radiation.

Moreover, the result of combining a camera containing a flash connected optically to the exterior by an optical fiber would not be an apparatus as claimed. It would not even broadly be an apparatus for pulsed light cosmetic or therapeutic treatment.

Furthermore, as remarked above, the embodiment to which this discussion of photography relates is the embodiment of Eckhouse’ Figure 4, which shows coupling of a

fiber to the light output of a lamp in a housing. That embodiment already has water cooling the lamp, as per column 10, line 8, the water filling the volume between the reflector and the fiber. Therefore, one cannot 'add' the water from Berry to this disclosure, it is already present.

The Board in the previous appeal took note of the disclosure of water in relation to Figure 4 of Eckhouse and explicitly held that it did not anticipate or make obvious Appellants' claims. Whether one relies on the water Eckhouse discloses or the water Berry discloses, the Figure 4 embodiment cannot invalidate claims 1 and 23.

Accordingly, in so far as Eckhouse describes apparatus for pulsed light cosmetic or therapeutic treatment (and so has any relevance to the issue of obviousness in relation to the invention as claimed), Appellants respectfully submit that removal of heat is contrary to Eckhouse' purposes, which are to effect treatment by heating.

The remaining passages of Eckhouse cited by the Examiner refer to "treatment of psoriasis and warts (column 16, line 43); throat lesions and gynaecological problems (column 16, lines 46-47)." *See* Answer at page 6. The Examiner contends that these are not uses dependent on tissue heating, but the Examiner does not say how the Examiner thinks that these uses work if not by heating. Appellants submit that in fact these are all uses that depend on tissue heating and Eckhouse certainly does not state otherwise.

Psoriasis, as is well understood by those skilled in this art, is a condition in which the skin surface cells are produced at an excessive rate and surface blood vessels proliferate to feed those cells. Psoriasis is treated by intense pulsed light by heating those surface blood vessels to produce coagulation so as to shut off the feeding of the lesions. Thus, this is clearly a use of intense pulsed light that is dependent on producing heating. The Examiner is simply wrong.

Appellants submit that Warts equally are treated by intense pulsed light by heating to produce thermolysis (*see*, for example, the article "The Treatment of Warts Intense Pulsed Light Technology," by Jose Gonzales, M.D., University of Puerto Rico, Department of Dermatology, published by Palomar Medical Technologies, Inc., 2004 (available at <http://www.palomarmedical.com/FileUploads/Gonzalez-WartsIPL-1553-0003.pdf>, last visited on November 24, 2009), that explains the principles and describes the results of using

a light source which includes wavelengths of 870-1400nm, well into the 'heating radiation' part of the spectrum (col. 2, paragraph 2)).

The gynaecological problems mentioned by Eckhouse are specifically said to be characterized by vascular malformations, and this would appear to apply also to the "throat lesions" mentioned in the same sentence. By omitting this context for the reference to these conditions, it is respectfully submitted that the Examiner clearly distorts the meaning of this passage of Eckhouse, which in no way supports the Examiner's contention that Eckhouse is here concerned with non-heating uses.

Since these are vascular disorders, it is clear that Eckhouse intends their treatment to be by way of vascular coagulation by heat. However, these treatments are clearly intended to be by the apparatus of Figure 4, and, therefore, are not relevant.

Appellants note that in discussing the purpose of the apparatus for which there is a need, Eckhouse notes at col. 2, line 57 that pulsed non-laser devices such as Eckhouse intends to employ can achieve the required thermal effects.

The Examiner contends at page 7, line 9 of the Answer that Eckhouse explicitly calls for treatments that require filtering out of infrared. The Examiner draws attention to col. 11, lines 8-19 of Eckhouse. Nowhere in this passage does Eckhouse refer to "filtering out of infrared" or "heat radiations." Respectfully, the Examiner puts the matter in that way because the Examiner wants to try to equate what Eckhouse actually teaches with the wording of Berry as nearly as the Examiner can. There is however a valid distinction to be made between the removal of the wavelengths specifically indicated by number in this passage and the effect of using water as a filter.

None of the wavelength ranges described in this passage of Eckhouse would be achievable by the combination of Eckhouse with Berry that the Examiner proposes. Thus, for the treatment of arteries, Eckhouse suggests a wavelength range of 520-650nm. That would involve filtering out all wavelengths above 650nm, but that would not be achieved by the use of water as a filter. As mentioned in the present application at page 15, line 10, the beauty of water as a filter in the context of the invention is that it selectively filters out just those wavelengths which would be absorbed in water in the body and which would thereby cause heating in the body, especially at the skin surface. Other infrared wavelengths will be transmitted, so the filtered output of the flashlamp in Eckhouse would not be 520-650nm if

water were to be used as a filter, even in combination with a cut-off filter removing wavelengths below 520nm. Similar remarks apply to Eckhouse' recommendation of 520-700nm for veins less than 0.1mm in diameter. One would not get that range by using water as a filter.

Logically, using water as a filter cannot be suitable both for producing 520-650nm and 520-700nm as one single filter arrangement cannot provide two different outcomes. The Examiner does not explain which range water is supposed to provide or why.

The other ranges suggested here by Eckhouse run up to 1000nm, and here water would be interfering with the desired result by removing wanted wavelengths below the 1000nm cut off.

This passage of Eckhouse clearly cannot suggest to the skilled reader that the desired result of finely tuned specific ranges can be obtained by the use of water as a filter. Indeed, a desire to obtain any of these ranges would exclude the possibility of using water as a filter.

The Examiner further states that Eckhouse refers to myriad filters being used in his device. Eckhouse at col. 10, line 61 does refer to various specific filters, but it is instructive to note that each of these is a UV cut off filter excludes wavelengths below a certain value. The Examiner points to a statement here by Eckhouse that combinations of various filters may be used (*see* Eckhouse at col. 10, line 66). None of these statements in Eckhouse however point to a desire to achieve the filtering result that would be produced by the use of water as a filter, as would be produced by combination with Berry. Clearly, Eckhouse will need combinations of filters to achieve the specific spectral ranges taught in column 11, but water will not serve his purpose.

In summary, there is no suggestion in Eckhouse that it would be sensible to filter out wavelengths on the basis that they are 'heat radiations', which is the result promised in Berry. All the uses of the device of Eckhouse that are at all relevant to this invention are ones that depend on producing heating of target structures. Neither is there any suggestion in Eckhouse of a desire for a spectral range that would be produced by using water as a filter.

The Examiner next takes issue with Appellants' argument advanced previously that Berry is not concerned with blocking heat transfer to the surface of any tissue. The Examiner argues that Berry must prevent heating the surface of tissue since all tissues have a surface, even internal ones. *See* Answer at pages 7-8. Respectfully, the Examiner's argument has not

merit. Appellants' argument was that Berry seeks to avoid heating. This ambition is not limited to the surface of tissue. Berry seeks to avoid all heating of the tissue. This is what is incompatible as an aim with Eckhouse. Eckhouse depends for therapeutic effect precisely on heating. While Berry is teaching a UV light application device with heat radiations removed, Eckhouse is teaching a heating device with UV radiation removed. Berry discloses no intention to produce any heating at all. The two are fundamentally incompatible in their aims.

The Examiner points out that both Eckhouse and Berry are concerned with treating internal body structures by invasive therapy. However, it is important to recall that Eckhouse' Figure 1 embodiment is not for internal, invasive use. It must be with this embodiment that the Examiner proposes to combine Berry's water filtration, because the internal, invasive embodiment of Eckhouse (Figure 4) already has water present in the lamp housing. The Board rejected combinations based on Figure 4 in the last appeal, but combination of Eckhouse Figure 4 with Berry is simply not meaningful.

The Examiner next argues that Eckhouse seeks to "keep the tissue cool" and one means to do this is to monitor the skin temperature via infrared emission in real time. *See* Answer at page 8. The Examiner argues that Eckhouse teaching is flawed because if infrared light were used in treatment, some would reflect off the skin, giving an erroneous reading.

In response, Appellants submit that it is not true that Eckhouse discloses a desire to "keep the tissue cool." Eckhouse discloses an apparatus in Figure 1 (and for almost all purposes also in Figure 4) which is intended to heat tissue to a temperature and for a duration such that substantial changes will be produced in it, such as thermocoagulation. What Eckhouse actually teaches in relation to the IR temperature measurement is not a desire to keep tissue cool but a desire to prevent it becoming excessively hot. There is a substantial difference. There are various references in Eckhouse to "allowing the skin to cool" or "cooling the skin" and the like, but these do not equate to "keeping the tissue cool." On the contrary, they relate to what happens after the skin has become hot. The skin is not kept cool.

The suggestion that reflected infrared can upset the temperature measurement has no basis. If it were true, it would be a problem that it would have been inventive, not obvious, to detect and to solve. This would be especially the case since Eckhouse purports to have carried out such measurement and to have found that it is "easy" (*see* Eckhouse at col. 6, line 64). There would however be no reason to suppose that the imagined difficulty would be



resolved by the use of a water filter to remove selectively those wavelengths absorbed by water. Following the Examiner's reasoning one would surely employ instead a long wavelength cut off filter to take out all infra red, not water.

Returning to the theme of filtering (*see* Answer at page 8, last paragraph), the Examiner next takes issue with Appellants' argument as previously presented that if one practiced Eckhouse with the suggested range of 520-650nm, one would have had to use a filter removing everything longer than 650nm and then the use of a water filter would be redundant. However, the Examiner merely directs attention to a passage of Eckhouse at col. 10, line 51 to col. 11, line 3, without explaining why it is relevant to that point. The Examiner has marked in bold the text **"combinations of the various filters described herein, or other filters may be used."** However, that reference to "other filters" clearly does nothing to undermine the point that the use of the water filter would be redundant in the hypothesized circumstances.

In attacking submissions made by Appellants at page 19, second paragraph of the Appeal Brief, the Examiner at page 9, last paragraph running onto page 10 of the Answer states "[t]hus the Appellant's arguing of only the preferred embodiment of the Eckhouse device, treating the skin, are (sic) not convincing in light of the many other applications taught to be appropriate for the Eckhouse device." Here again, the Examiner is once more conflating the different preferred embodiments in Eckhouse into one "device" for the purpose of misapplying statements made in relation to an irrelevant embodiment (Figure 4) to the Figure 1 embodiment. Thus, "the many other applications taught to be appropriate for the Eckhouse device" beyond treatment of the skin are not applications taught for the Figure 1 device and it is only in respect of the Figure 1 device that addition of water as a filter makes any sense, since it is already present in the device of Figure 4. The device of Figure 1 is suitable only for external treatment and is described only for use in treating the skin.

The Examiner refers at page 10, line 5 of the Answer to the possibility of using the Eckhouse device for the purposes of Berry. It is very plain that one cannot use the Eckhouse device of the Figure 1 embodiment for the purposes of Berry as it is not designed to make invasive treatment a possibility. Furthermore, all embodiments of Eckhouse use filtering to remove UV and the application of UV is essential to whatever form of treatment is intended in Berry, so this example of an "obvious" use of the Eckhouse apparatus is an entirely false one.

At page 10, last paragraph, of the Answer, the Examiner again refers to col. 11 of Eckhouse to suggest that the instruction in Eckhouse to select filtering which is optimized for the intended treatment would suggest removal of infrared for some uses. The Examiner suggests that it would be clear to the reader that the inclusion of infrared would not be optimum for treating the skin surface because this would allow heating of deeper structures by penetrating infra red light.

The Examiner's view of what is clear in this respect runs contrary to what Eckhouse explicitly teaches. At col. 5, line 45, Eckhouse teaches the following:

Optical and neutral density filters 18 are mounted in housing 12 near the treatment area and may be moved into the beam or out of the beam to control the spectrum and intensity of the light. Typically, 50 to 100 nm bandwidth filters, as well as low cutoff filters in the visible and ultraviolet portions of the spectrum, are used. In some procedures it is desirable to use most of the spectrum, with only the UV portion being cut off. In other applications, mainly for deeper penetration, it is preferable to use narrower bandwidths. The bandwidth filters and the cutoff filters are readily available commercially.

[emphasis added]

Thus, other than for deeper treatment one is instructed to keep the infrared, cutting off only the UV (*"desirable to use most of the spectrum, with only the UV portion being cut off"*). For deeper treatment one is instructed to remove some wavelengths but it is not stated which. Since the infrared wavelengths will penetrate better, it is not sensible that it should be those that are removed, so the instruction may reasonably be construed as one to remove some visible wavelengths. The Examiner's interpretation is indeed not reasonable.

At page 11, first paragraph, of the Answer, the Examiner returns to the issue of temperature measurement and the suggestion that infrared in the flash lamp output would interfere with measurement of the temperature of the skin, despite Eckhouse teaching that it is easy. The Examiner restates the position that a skilled reader would understand that to measure the temperature easily one would have to filter out the infrared. This is pure conjecture on behalf of the Examiner unsupported by anything in either reference. Moreover, it clearly is not consistent with Eckhouse' several teachings to use infrared. As pointed out above, col. 5 of Eckhouse instructs that one can use most of the spectrum, with only the UV being removed. Furthermore, several wavelength ranges suggested by Eckhouse explicitly include infrared, as at col. 11, line 14, of Eckhouse so the un inventive but skilled reader

cannot possibly conclude that infrared removal is important for successful temperature measurement.

Criticizing Appellants for asking what is “being substituted” in the proposed combination (*see* the Final Office Action, page 4, line 1), the Examiner at page 11, paragraph 2, nonetheless still fails to state what in Eckhouse is being substituted by the water filter of Berry. *See* Answer at page 11. That said, the Examiner still does not say what is being removed from Eckhouse to be replaced by the water filter.

In the passage commencing in the last paragraph of page 11 and running through the first paragraph of page 12 of the Answer, the Examiner acknowledges that in the first appeal the Examiner erroneously attempted to combine embodiments from the same reference and maintains that this time around the Examiner is utilizing one of the embodiments of the Eckhouse device, albeit not the preferred skin treatment one. However, the Examiner does not identify by figure number what this embodiment of Eckhouse is, but indicates that it is for invasive treatment. However, the invasive treatment device of Eckhouse is that of Figure 4, which already has the ‘water feature’. Combination of Berry with that is just not meaningful, but more importantly in the context of this section of the Examiner’s answer, the Board of Appeal has already held that the Figure 4 embodiment does not disclose essential features of claim 1 (aside from water). In ignoring this aspect of the Board’s findings, Appellants respectfully submit that the Examiner clearly is not giving due deference to them.

Appellants note that the allegation that the Examiner is relying on an invasive embodiment of Eckhouse is clearly contradicted by the Examiner’s position on removing infrared being motivated by a desire to measure accurately the temperature of the skin surface.

The Examiner then goes on to suggest that it is in fact Figure 1 of Eckhouse with which the Examiner is combining Berry after all. *See* Answer at page 12. That is not consistent with the Examiner’s earlier statement that it is the invasive apparatus of Eckhouse that he is relying on.

Accordingly, Appellants respectfully submit that the Examiner is continuing to mix and match selections from different embodiments of Eckhouse to try to construct a *prima facie* case of obviousness. This is clearly improper.

For at least the foregoing reasons, Appellants respectfully submit that claim 1 is not obvious in view of the combination of Eckhouse and Berry. Therefore, the rejection of claim 1 must be withdrawn.

Claim 23 is patentable over the Eckhouse, Berry and any proper combination thereof at least by virtue of its dependency from claim 1 and for the additional features recited therein.

**b. Rejection of claims 1-3, and 8 over Eckhouse in combination with Berry and further in view of Gustafsson (U.S. Patent 5,320,618)**

The combination of Eckhouse, Berry and Gustafsson cannot stand unless it is obvious to combine Eckhouse with Berry in the first place. As noted in Appellants' brief, Eckhouse, Berry and Gustafsson fail to disclose all of the elements recited in applicants' claimed invention. Further, Eckhouse, Berry and Gustafsson fail to provide a basis to establish obviousness under additional rationales, including simple substitution for one known element for another to obtain predictable results, use of known technique to improve similar device in the same way, applying a known technique to a known device ready for improvement to yield predictable results, obvious to try, or the presence of a teaching, motivation, or suggestion. Thus, reconsideration and withdrawal from this rejection, and allowance of claims 1, 3 and 8 are respectfully requested.

**c. Rejection of claims 10-15, 24 and 25 over Eckhouse in combination with Berry and Gustafsson and further in view of Anderson (U.S. Patent 5,785,844) and Optoelectronics**

All of these claims are dependent on claim 1. As argued above, therefore, they are patentable over the combination of Eckhouse, Berry and Gustafsson for the reasons set forth above, as well as for their recitations of additional patentable features. It should be noted that Anderson and Optoelectronics do nothing to strengthen the objection to claim 1. That alone is sufficient to defeat the objection against these claims.

**d. Rejection of claim 18 over Eckhouse in combination with Berry and Gustafsson and further in view of Vassiliadis (U.S. Patent 3,703,176)**

Claim 18 is dependent on claim 1. Therefore, claim 18 is patentable over the combination of Eckhouse, Berry and Gustafsson for the same reasons set forth above, and for additional recitations. It should be noted that Vassiliadis does nothing to strengthen the objection to claim 1. That alone is sufficient to defeat the objection against this claim.

**V. Conclusion**

In conclusion, Appellants respectfully submit that, based on the reasons advanced above and in the Appeal Brief, claims under appeal are patentable. Accordingly, the Appellant respectfully requests this Honorable Board to reverse the rejection of these claims and direct that the claims be passed to issue.

Respectfully submitted,

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